

**WHAT IS CLAIMED IS:**

1. An orthodontic separator, said separator dimensioned such that it can be inserted between adjacent teeth, said separator being characterized in that when inserted between adjacent teeth in the oral environment, it exhibits an increase in compressive force, wherein the separator exerts sufficient force on the adjacent teeth to push the teeth apart.
2. The orthodontic separator according to claim 1, wherein the compressive force exerted by the separator increases by greater than about 5% within about 4 hours as measured by the Compressive Force Measurement Test Procedure.
3. The orthodontic separator according to claim 1, wherein said separator is a polymer that expands from an original volume  $V_0$  to a volume  $V_1$  in the oral environment, where  $V_1 > V_0$ .
4. The orthodontic separator according to claim 1, wherein said separator comprises a hydrophilic polymer.
5. The orthodontic separator according to claim 4, wherein said hydrophilic polymer absorbs between 6 and 120% by weight water.
6. The orthodontic separator according to claim 4, wherein said hydrophilic polymer undergoes a weight increase of between 50 to 70 % after immersion in water for 1 hour at 37°C.
7. The orthodontic separator according to claim 4, wherein said hydrophilic polymer undergoes a weight increase of between 60 to 80 % after immersion in water for 16 hours at 37°C.
8. The orthodontic separator according to claim 4, wherein said hydrophilic polymer undergoes a volume increase of between 80 to 100% after immersion in water for 2 hours.

9. The orthodontic separator according to claim 4, wherein said hydrophilic polymer comprises a polyurethane.
10. The orthodontic separator according to claim 9, wherein said polyurethane comprises an aliphatic polyether polyurethane.
11. The orthodontic separator according to claim 4, wherein said hydrophilic polymer is selected from the group consisting of cellulosic polymers, polyamides, polyether polyamide copolymers, ethylene vinyl acetate copolymers, polyvinyl alcohol, polyvinyl acetate, polymethylmethacrylate, ethylene oxide copolymers, and combinations thereof.
12. The orthodontic separator according to claim 1, wherein said separator comprises a radio-opaque additive.
13. The orthodontic separator according to claim 1, wherein said separator comprises a shape memory material.
14. The orthodontic separator according to claim 13, wherein said shape memory material comprises a metal alloy.
15. The orthodontic separator according to claim 14, wherein said metal alloy comprises NiTi.
16. The orthodontic separator according to claim 13, wherein said shape memory material comprises a shape memory polymer.
17. A method for separating a pair of adjacent teeth in a patient's mouth comprising inserting an orthodontic separator between the adjacent teeth, wherein upon insertion said separator exhibits an increase in compressive force and expands to exert sufficient force on the adjacent teeth to push the teeth apart.

18. The orthodontic separator according to claim 17, wherein the force exerted by the separator increases by greater than about 5% within about 4 hours as measured by the Compressive Force Measurement Test Procedure.
- 5 19. The method according to claim 17 further comprising removing said separator from between the teeth by drying said separator with an air syringe.
20. The method according to claim 17 further comprising removing said separator from between the teeth by applying a compressed coolant gas to said separator.
- 10 21. A method for separating a pair of adjacent teeth in a patient's mouth comprising inserting an orthodontic separator comprising a shape memory material between the teeth, wherein upon insertion said separator is heat activated to exert sufficient force on the adjacent teeth to push the teeth apart.
- 15 22. The method according to claim 21, wherein the force exerted by the separator increases by greater than about 5% within about 4 hours as measured by the Compressive Force Measurement Test Procedure.
- 20 23. The method according to claim 21 further comprising removing said separator from between the teeth by applying a compressed coolant gas to said separator.